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DIRECTORATE OF
INTELLIGENCE

Intelligence Report

Geographic Brief on
Thailand-Malaysia Border Area

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CIA/BGI GR 69-3
April 1969

NND 941536 --- 3962

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FOREWORD

The Thailand-Malaysia border area, long plagued by economic instability, continues to be a center of potentially dangerous insurgency on the Malay Peninsula. Attempts to strengthen the unstable economy have to date been unsuccessful, and joint counterinsurgency efforts have been rather ineffective.

This report is intended for use as a brief orientation aid by persons concerned with events or programs in the area. A similar report is available on the north Thailand-Northwest Laos border area (CIA/BGI GR 69-1, *Geographic Brief on North Thailand-Northwest Laos Border Area*, December 1968).

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
March 1969

INTELLIGENCE REPORT

Geographic Brief on
Thailand-Malaysia Border Area

BACKGROUND

(See Maps 1 through 4)

1. The territory encompassed by this report includes all or portions of the five southern changwats of Thailand (Narathiwat, Pattani, Satun, Songkhla, and Yala) and the five northernmost states of West Malaysia (Kedah, Kelantan, Penang, Perak, and Perlis). Occupying some 20,000 square miles, the "border area" is approximately the size of the state of West Virginia. Rugged, except along the coasts, it is generally hot and humid, densely forested, and largely underdeveloped. While it is populated predominantly by Malays, the Thais form a majority in northern Songkhla, and in southern Perak, the Chinese are dominant.

2. The Thailand-Malaysia border extends irregularly from the Gulf of Siam on the east to the Strait of Malacca on the west, for the most part traversing steep sided and densely forested mountains; only on the coasts does it cut across narrow, low-lying plains and mangrove swamps. Continuing into the Strait of Malacca, it separates the islands of Ko Tarutao (Thailand) and Pulau Langkawi (Malaysia). The present border is the result of historical agreements negotiated between the Thais and the British, following the 19th century expansion of the latter into Malaya. By the terms of the final treaty, signed in 1909, control of the four border area sultanates (Kedah, Terengganu, Perlis, and Kelantan) was awarded to the British. Although Thailand temporarily regained control of these sultanates during World War II, with the end of hostilities they reverted to British administration. In 1957 they became states of the independent Federation of Malaya, and subsequently, in 1963, they were incorporated into Malaysia.

3. Insurgency in the border area is a result of the armed revolt mounted by the Communist Party of Malaya (MCP) in 1948 against the British administration. The subsequent emergency, which officially lasted until July 1960, was a disaster for the MCP, the decisive blow coming in 1957 when Malaya gained her independence and most of the support for the MCP, the "party of liberation," disappeared. The paramilitary arm of the MCP, the Communist Terrorist Organization (CTO), fled across the border into Thailand, which it now uses as a safe-haven and as a base for the training of guerrilla forces.

Note: This report was produced by CIA. It was prepared by the Office of Basic and Geographic Intelligence and coordinated with the Office of Economic Research and the Office of Current Intelligence.

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4. The Government of Thailand agreed with the British in 1956 to exchange intelligence, conduct joint patrols, and allow either party to penetrate up to 20 kilometers into the territory of the other, when in hot pursuit of the enemy. The agreement was continued by Malaya when she achieved independence, and in 1959 a joint border committee was formed to direct operations against the Communists. The Thai Government, however, has never considered the CTO a real threat, and it has not seriously attempted to eliminate CTO influence. The agreement between the two countries was therefore permitted to lapse in 1963. Shortly thereafter it was renewed, mostly because Indonesian policies were interpreted as potentially threatening to border security. In 1965, a joint intelligence center was established at Songkhla for the Malaysian-Thai Regional Border Committee. Since then, however, the Thais have continued to make only desultory attempts to rout out guerrilla bands.

5. The Malaysians, on the other hand, have been continuously carrying on an active counter-terrorist program. In their attempts to control movement in the border zone they have cleared out almost all residents in a strip of territory that is at least a mile wide, and in some places wider, along the entire boundary. The few people who remain endure a virtual curfew between the hours of 6 p.m. and 6 a.m. daily. Following a border ambush in June 1968, which resulted in heavy casualties for a Malaysian patrol, Malaysia pressed anew, but with little success, for greater Thai security efforts.

6. The threat of subversion is aggravated by a precarious economy that is chiefly dependent on rubber, tin, palm oil, and fishing. A program of further economic diversification and expansion is clearly desirable, but this would require much planning, cooperation, and time. Meanwhile, large segments of the population remain restless and dissatisfied.

TERRAIN AND DRAINAGE

(See Map 1)

7. The terrain of the border area is predominantly mountainous, with four distinct interior ranges forming the "backbone" of the peninsula. Peaks near the border average about 3,000 feet, and the highest elevations are recorded in the southern portion of Kelantan. The most important range on the Malaysian side of the border swings slightly to the west of the center of the peninsula; in its western foothills are found the rich tin deposits of Perak. Paralleling the mountains are large numbers of rough limestone pinnacles that are honeycombed with caves (see Figure 1). In general, the rugged, heavily forested mountains of the border area are well suited for guerrilla-type operations and bases.

8. The coastal plains are generally flat, but in the transitional areas approaching the mountains they are undulating (see Figure 2). The western coastal plain in Thailand is narrow, swampy, and underdeveloped; the coastline is very irregular, and there are numerous estuaries and embayments. Islands and islets, characterized by rocky shores and forested, hilly interiors, are scattered off the coast at distances of up to 50 nautical miles. In Malaysia the western coastal plain

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FIGURE 1. Densely forested terrain west of Bannang Sata, Thailand. Karst pinnacles dominate the landscape with granitic mountains visible in the background. Such terrain provides excellent base areas for insurgent guerrillas.



FIGURE 2. Foothills west of Hat Yai, Thailand. Scattered plots of slash-and-burn cultivation are evident in foreground. The rail line links Hat Yai and Yala.

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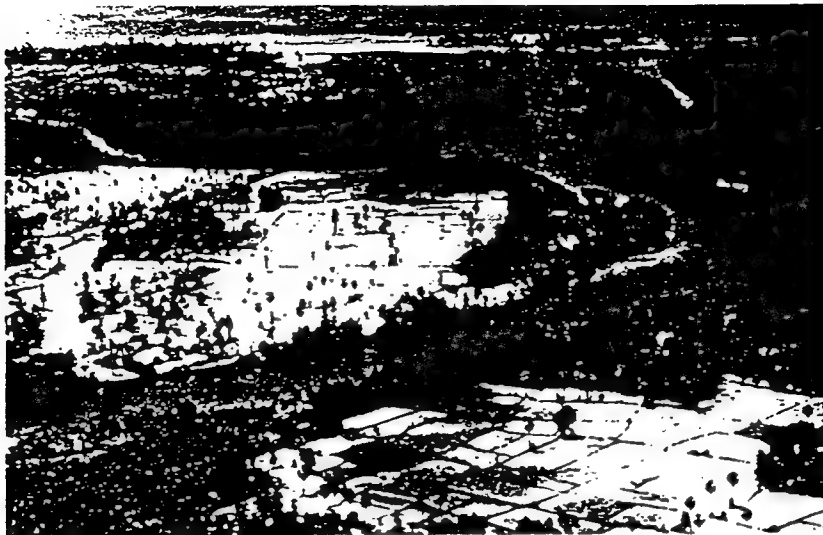


FIGURE 3. East coast plain northwest of Narathiwat, Thailand. Rice paddies are a common sight on the east coast.



FIGURE 4. Coconut palm trees on the east coast at Narathiwat, Thailand. The sandy soil adjacent to the water is a favorable environment for the trees, which are used locally for food, oil, and fiber.

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widens to about 40 miles; the coast is practically an unbroken succession of mangrove swamps and mudflats. Clustered offshore are many hilly islands similar to those north of the boundary.

9. The east coast (see Figures 3 and 4) contrasts distinctly with the west coast. In Thailand it is smooth and regular, with few bays and many long beaches. The coastal plain is between 3 and 22 miles wide, and river plains and basins extend far inland. A large inland sea, Thale Luang, important for commercial fishing, lies north of Songkhla. A few hilly islets with rocky coasts lie as far as 35 nautical miles offshore. In Malaysia the east coast consists of long sandy beaches, and sandbanks and bars have formed across the mouths of most of the rivers. Inland from the sandy shore are swamps and lagoons that limit settlement and economic development. The coastal plain near the border area is 40 miles wide, but it narrows to about 5 miles where the mountains are close to the sea in the south. Offshore are a few hilly islands and islets with rocky or reef-fringed shores.

10. Streams throughout the border area commonly flow in deep V-shaped valleys through the mountains and in broad and unrestricted valleys on the plains; those on the west coast tend to be shorter than those on the east, and many of them end in tidal estuaries. On the east coast, in contrast, the streams are sinuous and slow moving, not unlike those of Louisiana, and commonly they terminate in coastal lagoons.

11. A number of programs are underway in both countries to control and exploit streams in the border area. In Malaysia the Muda River is being harnessed near the Thai border to provide irrigation water for a second crop of rice and to control floods. In Thailand a hydroelectric power and flood control dam has been proposed on the Pattani River at Yala. If and when completed, it may possibly supply electric power to Malaysia.

CLIMATE

(See Map 2)

12. The border area is hot and humid throughout the year. Daily temperatures in the lowlands range between 70°F and 90°F; the uplands are somewhat cooler, ranging between 55°F and 80°F. Annual temperature ranges are not significant.

13. Seasonal variations in rainfall are caused by the shifting of the monsoons. From November to mid-March the moisture-laden northeast monsoons bring increased precipitation and cloudiness to the east coast and the eastern mountain slopes, while the western slopes and the west coast are relatively less wet. The monsoon is strongest in December, the wettest month, when between 14 and 30 inches of rain fall on the east coast. The force of this monsoon is slowly dissipated after December, and by March the rainfall decreases to less than 10 inches over most of the peninsula.

14. Between mid-March and mid-May the border area is characterized by variable winds, as the northeastern flow of air shifts to the southwest. Because

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the airstreams over the peninsula fluctuate erratically at this time, many interior locations experience increased precipitation.

15. The southwest monsoon dominates circulation over the peninsula from mid-May through September, but as the full impact of the monsoon from the Indian Ocean is first released on Sumatra, much of the west coast of the border area initially experiences an actual decrease in rainfall. By August, precipitation increases to over 10 inches a month at most west coast locations, and it remains at this high level through October. During this season the leeward east coast is relatively less rainy.

16. The autumn transition from the southwest to the northeast monsoon occurs in October. Winds at this time are variable, but monthly precipitation is still in excess of 10 inches over most of the peninsula.

VEGETATION

17. Under the favorable influence of a hot climate, a great variety of lush, tropical vegetation grows in the border area. Tropical rain forest prevails on the hills, mountains, and on extensive parts of the coastal plain, varying in undergrowth, height, and seasonal leaf-bearing patterns in consequence of the local ecology. Wherever the annual rainfall is sufficient and evenly distributed, there is no appreciable undergrowth, but in areas where trees lose their leaves during the driest months of the year, a maze of thorny bamboo, lianas, ferns, and creepers makes movement off established routes difficult. Jungles of tangled vegetation are also associated with secondary forests—those that have sprung up on abandoned land that was formerly cleared. Above 4,000 feet the trees are not as tall, and the undergrowth is less dense. Clearly, the extent and density of the forests contribute to the suitability of the border area for guerrilla operations and complicate counterinsurgency activities.

18. On the coastal plains there are numerous small areas of cleared land, patches of forest, and many swamps. Mangrove and nipa palm swamps are common, especially on the west coast where the wave action is not severe. Here movement is restricted by a dense tangle of roots in the brackish muck. Inland from the mangrove and nipa palm swamps are freshwater swamps, many of which have been drained and cleared for cultivation.

SETTLEMENT PATTERNS

(See Map 3)

19. Most of the border area's 3,625,000 people are concentrated along the coasts, on the west in Malaysia and on the east in Thailand. The mountainous interior is sparsely populated. Basically, there are three settlement types—the strip village, the cluster village, and the dispersed village.

20. The strip village is the most common of the settlement patterns in the border area. Such villages typically stretch along one or both sides of a river,

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canal, or roadway. Strip villages may be several miles in length, and in densely settled areas, adjoining villages may coalesce to form a continuous line in which there is no apparent demarcation between settlements.

21. In close association with the strip villages are cluster villages, which are usually set back several hundred yards for a main thoroughfare—a river, navigable canal, railroad line, branch road, or main highway. Villages of this type are ordinarily situated in and around a grove of fruit trees or coconut palms. Cluster and strip villages are commonly found both on the coastal plain and in the mountainous interior.

22. The third and least common type of settlement pattern is the dispersed village, found inland from the coastal plains in the foothills adjacent to river valleys. Dispersed villages are commonly situated between rice paddies lying in the valley bottoms and the belukar (cutover jungle) and rubber trees on the upper slopes.

ETHNIC GROUPS

(See Map 4)

23. The border area is peopled by various ethnic groups, but the majority are Malay (see Figure 5). The others—Thai,* Chinese, Indian, Negrito, and Senoi—exert their influence on the multiracial society in varying degrees. To a great extent religion differentiates the groups (Malay-Muslim, Thai-Buddhist, and Indian-Hindu), but fine distinctions are difficult to make because a considerable amount of assimilation into either the Thai or Malay society has occurred. In an attempt to hasten assimilation of the various groups within their respective borders the Thai and Malaysian Governments for statistical purposes group their citizens in terms of nationality rather than by ethnic group. However, using the statistics on religion in the Thai census, it is possible to determine the ethnic composition of a changwat. Thus, as most Thai in Thailand are Buddhists, the approximate number of Thai in a changwat is indicated by the number of Buddhists. Although the Malaysian census purports to group the population by "race," the figures are not totally accurate because members of any ethnic group who regard themselves as assimilated into the Malay culture are referred to in the census of Malays.

Malay

24. About 700,000 Malays are in the five southernmost changwats of Thailand and about 1,478,000 Malays are in the five northernmost states of Malaysia. Until conquered by the Thai in 1832, the southern provinces of Thailand comprised the Kingdom of Pattani, one of the largest and most important of the Malay Kingdoms, and even now many Thai Malays are psychologically oriented toward

*In most publications "Thai" is generally used to denote citizens of Thailand, whereas "Tai" refers to all ethnic Tai. To avoid ambiguity, however, "Thai" is used in this report to refer to all Tai in the peninsular area.

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FIGURE 5. Typical town market. All ethnic types mingle in the towns, especially in the markets. Note the variety of fruit, including the spiny durians in the foreground. They are highly prized as delicacies by the local population, but they are notorious for their sulfurous odor.

Malaysia. The cohesion of Thai Malays and Malays in Malaysia is natural because of common religion, culture, and language. The Malays are rural, although they tend to live in villages (kampongs), which are the most important unit of society after the family. Most Malays in the border area are rubber planters, farmers, and fishermen. They are distinguished from non-Malays by their Islamic religion (see Figure 6).

25. The Muslim (Malay) population in Thailand believes that it is not completely accepted by the Bangkok Government on an equal basis with the Thai

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FIGURE 6. Thai Malays at a well in front of the town mosque at Narathiwat, Thailand. Islam among the Malays is tinged with vestiges of animism and Hinduism.

Buddhists. While generally passive, there are some Muslims who would like to see the five southern provinces under Malaysian control. Being represented chiefly by a handful of elderly conservative Muslims in Pattani, however, they appear to be only a minor problem in the border area.

26. The Malaysian Government professes not to be interested in annexing the five southernmost provinces of Thailand, and within the Kuala Lumpur Government there is some concern about contact between Thai Malays in Narathiwat and the Pan-Malaysian Islamic Party (PMIP) in Malaysia. The PMIP is strongest in the state of Kelantan, and this facilitates their overtures to Muslims in neighboring Narathiwat.

27. Several other Malay groups threaten border area security on the Thai side. Among the Thai Malays there are a few bandits who operate in Pattani and several districts of surrounding provinces. Their interest is money, not politics, but the Thai Government fears a possible coordination of bandit activity with the efforts of the ethnic Chinese Communist Terrorists (CT's).

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Thai

28. Numerically the Thai are a minority in the border zone. In the five southernmost provinces of Thailand they number about 563,000; some 40,000 more of them are also concentrated in the four northernmost states of Malaysia. In Thailand only a small proportion of the residents of the border area are Thai, and most of these are found in the towns. A disproportionate number of Thai are associated with the military, police, and civil administration. This is not due to the direct exclusion of Malays from positions, but to employment standards that require fluency in the Thai language. In Malaysia the Thai are peaceable Buddhists who reside in villages, apart from the Malays.

29. Relations between the Buddhists and the Muslims in southern Thailand are not entirely harmonious because of Muslim (ethnic Malay) resentment against official domination by the Thai Buddhist minority (see Figure 7). Corruption of local government employees is a common complaint. Local Thai police

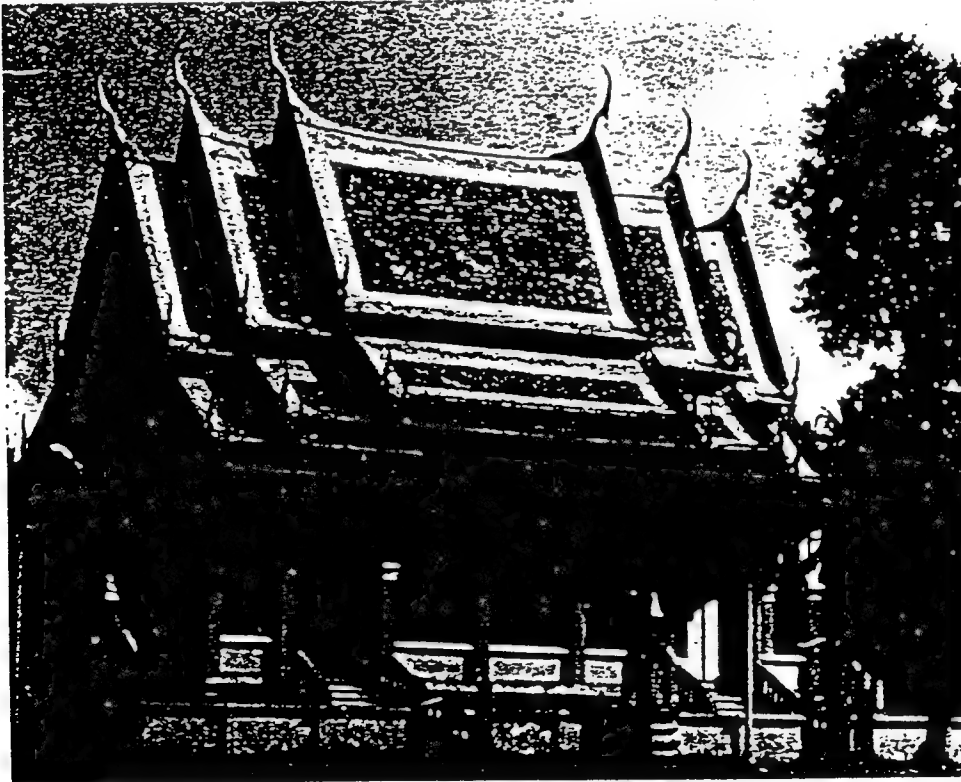


FIGURE 7. Buddhist wat at Hat Yai, Thailand. The Thai Buddhists are a minority group in the border area, but the fact that the Central Government in Bangkok is closely linked with Buddhism gives them a more prominent role in society than the more numerous Malays.

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think that they are neglected by Bangkok, believing that their Malaysian counterparts are better equipped, trained, and supplied, and are therefore less susceptible to bribes by Communists and others.

30. The Thai Government is working to improve its relations with the Muslims. It has undertaken a program of rural development and is now in the process of including in it health and sanitation workers as well as specialists in education and agriculture. A program to encourage the Muslim religious schools (parallel systems of Thai public and Muslim religious schools exist) to teach the Thai language has had some success. Four teacher-training institutes have recently been started in southern Thailand, as well as a General Educational Development Center at Yala. In addition to the Government-sponsored College for Muslims in Bangkok, the Southern Technical Institute is located in Songkhla, and the University of the South is to be opened soon in Pattani.

Chinese

31. According to official figures, ethnic Chinese represent some 3 percent of the population in the Thailand portion of the border area and some 28 percent in the Malaysian portion. These figures probably do not reflect the many ethnic Chinese who have been assimilated. In both countries there is a "Chinese Problem" in that the Chinese operate and control a considerable portion of the banking, insurance, export, import, wholesale, and larger retail establishments. They are the chief shopkeepers and middlemen, and generally they dominate the service industries wherever they are settled. They also supply the bulk of the industrial labor force. As a consequence, the Chinese have traditionally been regarded as exploitative and have been the target of resentment by the predominantly rural, non-Chinese society (see Figures 8 and 9).

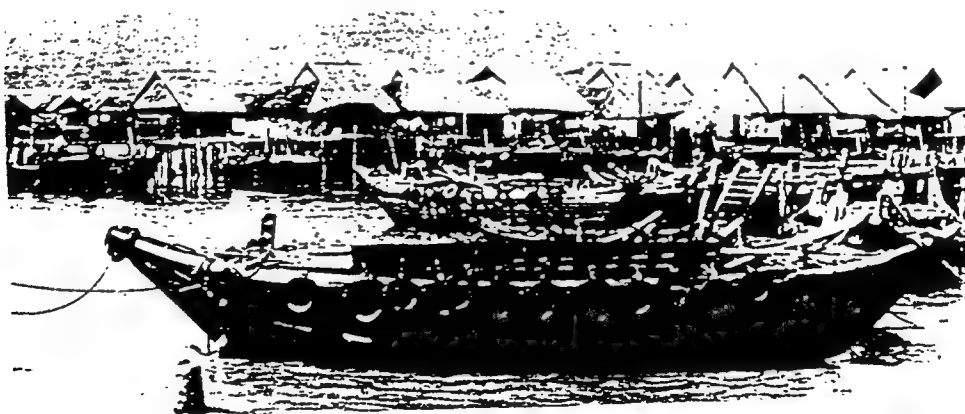


FIGURE 8. Housing along Penang waterfront, Malaysia. The boats in the foreground are built by Chinese for use as lighters.

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FIGURE 9. Chinese temple near Hat Yai, Thailand. Such temples do not include specific congregations, and the most frequent and important religious rites of the Chinese are carried out at home.

32. Generally, in Southeast Asia the Overseas Chinese have strongly resisted assimilation, but in Thailand they have often preferred assimilation in order to remove obstacles to their economic advancement. The Thai Government has imposed restrictive regulations on alien Chinese (those who have not become Thai citizens) such as excluding them from certain jobs or forbidding them to grow rice. The small number of rural Chinese in Thailand are, in general, less assimilated than their urban counterparts.

33. In Malaysia, a sizable part of the Chinese population maintains a sentimental attachment to China, although some genuinely regard Malaysia as their home. All Chinese seem to share the view that although they are responsible for making the Federation of Malaysia possible, the Government operates for the benefit of the Malays.

34. The Governments of Thailand and Malaysia are sensitive to the extent of the allegiance of the Chinese population to Mainland China and the support of the Chinese of the CTO. CT's number between 800-1,000 actives and are believed to be organized into three regiments and several thousand cadres. They are mostly ethnic Chinese, but in recent years Thais and Malays have also been subject to recruiting. Although the CT's may be conducting operations in Malaysia, their strategy is to maintain a safe haven in Thailand around Sadao and Betong until it is possible to return to Malaysia. CT's refer to themselves as guests of the Thai Government, and they seek to maintain proper relations with local officials. While there have been armed clashes between the CT's and the Thais, the former usually apologize to the local authorities when Thai officials have been killed. Largely as a result of Thai reluctance to move against the CTO, that

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organization retains control over the local Chinese population, particularly the youth. The Thai Government is now concerned about a possible alliance between the CTO and the Thai Communists.

Indians

35. While Indians constitute about 10 percent of the population in Malaysia, they are not numerically significant in the Thailand portion of the border area. Other ethnic groups tend to dislike the Indians, partly because many of them are businessmen and regarded as being exploitative. Malays regard Indians as being ethnically and religiously inferior, and the feeling is reciprocated. Politically, the Indians are not active, and they do not have a strong allegiance to their homeland that is comparable to that of the Chinese.

36. Indian society in the border area is both rural and urban in character. Most Indians, originating in southern India (Tamils, Telegus, Chetis, and Malayalis), work on the larger rubber, coconut, and palm oil estates as tappers, weeders, and harvesters. Some southern Indians, however, have become construction workers, clerks, and businessmen in urban areas. Very few have obtained prominent social or intellectual position by becoming doctors, lawyers, and teachers.

37. Northern Indians generally form a numerically small and relatively unimportant group, except for a small number of professionals. Originating primarily in the Punjab, they are not as exclusively associated with the estate economy as are those from southern India, although many of them, especially the Sikhs, serve as estate watchmen and policemen (see Figure 10).

38. The Indians have retained part of their Hindu culture, particularly old religious forms. On each estate there is at least one temple dedicated to a god derived from the Hindu pantheon, and in the towns there are usually Hindu temples. The temples are maintained by Brahman priests who act as intermediaries between the people and the god. Nevertheless a certain amount of cultural assimilation has occurred, and a few Indians have become Muslims.

Aboriginal People

39. Although between 40,000 and 80,000 aboriginal people inhabit the peninsula (about 500 in Thailand), it is not known how many are in the border area (see Figure 11). There are, however, two groups: the Negritoes (Semang) and the Senoi (Sakai). The Negritoes inhabit both Thailand and Malaysia, but the Senoi are found only in Malaysia.

40. Most of the Negritoes are hunters and gatherers, practicing no agriculture, except where they have interbred with agricultural tribes and have adopted their habits. Each small community of Negritoes migrates within its tribal territory, living in crude lean-to structures. The Senoi, on the other hand, practice a shifting form of agriculture, known locally as *ladang*. Senoi families live together in longhouses near their fields where they raise dryland rice, millet,

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FIGURE 10. Indian Sikh herdsman. Over one-third of the immigrants to Malaysia were from the lower castes in India, but the differences which formerly existed between the various castes have largely disappeared in Malay life.

tobacco, manioc, sweet potatoes, and bananas. They also do some hunting and gathering. As a consequence the subsistence and cultural levels of the Senoi are higher and more elaborate than those of the Negrito. Both groups are animistic and their religion involves numerous spirits and taboos, a large complex body of myths and legends, and a belief in innumerable deities.

41. Traditionally the aboriginal people have disliked and feared the Malays, and during the emergency they assisted the Communist guerrillas as food gatherers, scouts, and guides. The Malaysian Government began a program of resettlement and acculturation around 1956, and eventually it won the support of most of the indigenous people who were under Communist domination. As a result of this operation, which brought the aborigines into contact with many aspects of the Malay and European cultures, assimilation has been somewhat hastened.

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FIGURE 11. Aboriginal people. Some acculturation into Malay society has taken place, but the aboriginal peoples still represent a distinctly different social group. Their intimate knowledge of the terrain in the rugged interior mountains can make their assistance vital to outsiders conducting operations in the area.

ECONOMY

Agriculture

42. Agriculture is the mainstay of the economy of the border area where rice is the most important food crop, but a great variety of fruits and vegetables is also raised, along with sugarcane and, on the coasts, coconuts. Rubber is the most important cash crop, and oil palms, coconuts, spices, and fruit are also produced commercially. In the early 1960's, rubber accounted for 25 percent of the total value of agricultural exports in Thailand, almost all of which was produced on the peninsula, and in 1966, rubber accounted for 31 percent of the total export earnings of Malaysia.

43. Rubber is produced all along both coasts and, in particular, around Hat Yai (see Figures 12, 13, and 14). In Thailand, holdings are usually only a few acres in size, and the smallest units are occupied by Muslims; there are a few large holdings, however, and these are generally worked by the Thai-Chinese. Europeans own most of the large estates in Malaysia, where the British are now subdividing and selling their estates in a withdrawal program that may be com-

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FIGURE 12. Rubber plantation near Songkhla, Thailand. Five to 7 years' growth are required before tapping can be commenced.



FIGURE 13. Rubber tapping. Tappers collect the latex from the trees in the morning between 3 a.m. and 6 a.m., if possible, when it flows most freely.



FIGURE 14. Rubber sheets at factory near Hat Yai, Thailand. In preparing rubber for export the latex is first coagulated by the addition of a small quantity of formic or acetic acid. The rubber may be treated in various ways, but it is finally rolled and smoked or dried into sheets for export.

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pleted by 1975. Here the Malays own more than half of the smallest tracts (1-25 acres), and most of the medium-size tracts (25-100 acres) are in the hands of the Chinese.

44. The economy of the whole peninsula has been affected in recent years by the decline in price of natural rubber. This decline—from US\$0.35 per pound in 1960 to US\$0.15 per pound in 1968—reflects the improvement in and acceptability of synthetic rubber on the world's markets. In consequence thereof, all producers of natural rubber in the area have suffered, the small landowners of Thailand relatively more than the owners of large estates in Malaysia, where the export earnings of the country have been seriously cut. The worsening fortunes of the rubber industry have caused a number of economic problems for the area and its underemployed labor force, which is an ideal target for Communist propaganda; it is an unfortunate coincidence, therefore, that CTO activity is concentrated in that part of the border area that is suffering most because of the depressed price of rubber.

45. Malaysia and Thailand are now seeking to cope with the pricing problem by replanting higher yielding trees and by improving the quality of the rubber produced. It is also hoped that new or improved techniques of processing the latex obtained from older trees will enhance the competitive position of the natural rubber producers. While these programs are essentially necessary to the rubber industry, it is improbable that they can, by themselves, correct all of the area's economic ills.

46. Both Thailand and Malaysia now plan to substitute other crops for rubber. One of the most common alternatives being considered is the oil palm, already being raised in increasing quantity (see Figure 15). In the past 3 years, however, the price of palm oil has declined, and increased production has only partially compensated for the lower price. One advantage of the oil palm is that it bears harvestable fruit from the fourth to the 30th year, a period of yield that begins earlier and lasts longer than that of rubber. Plantations must be large and well organized, however, because a heavy capital investment and a large labor force are essential. Hence, small landowners are virtually excluded from such operations, unless the Government assumes responsibility for providing processing facilities (as Malaysia has done in Sabah).

47. The coconut palm offers another possibility for agricultural diversification. While replantation has already been carried out to a degree, there is a major drawback—the coconut palm matures more slowly than the rubber tree. Cultivation of upland crops, such as corn and sorghum, or fruit, such as pineapples and bananas, may also be expanded, but these efforts would be dependent on the improvement of transportation in the area and the development of export markets.

48. The main food crop on the peninsula is wetland rice, grown on the coastal plains of both countries (see Figure 9). Nevertheless, the entire peninsula is a rice deficit area, despite efforts to increase production. In Malaysia, various pilot

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FIGURE 15. Palm oil estate in Perak, Malaysia. Oil palms are most efficiently raised on large estates, but the Malaysian Government has initiated a program to teach small landholders the techniques of oil palm cultivation in order to reduce their excessive dependence on rubber production.

projects, including the introduction of new varieties of rice, have been tried with some success. Of the large quantity of rice that is brought into the peninsula from the Central Lowlands of Thailand, much is smuggled into Malaysia, and Thai Government attempts to prevent this smuggling appear to be largely ineffective. Much publicity is given to the "ant army" of small boys who smuggle small bags of rice across the border, but more significant are the bulk shipments that are regularly smuggled into Malaysia by wealthy and powerful individuals with government connections. Within Thailand, Bangkok is trying to control the distribution of rice, but the local Chinese population continues to supply it to the insurgents.

Fishing

49. Part-time fishing, one of the traditional bases of the area's subsistence economy, provides the Thais, Malays, Chinese, and Indians with their main source of animal protein and their second-ranking staple food (see Figure 16). Taken from both fresh and salt waters, the catch is distributed, sold, and consumed in fresh, dried, and salted forms.

50. Maritime fishing is largely dependent on the extensive exploitation of shallow (seldom in excess of 200 feet) waters of limited potential. Such waters along the west coast are more productive than those that are on the east coast, where fishing efforts are handicapped from December to February by the north-

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FIGURE 16. Malay fishermen near Kelantan, Malaysia. The men do the actual fishing; the women distribute and market the catch. Malay fishing boats are highly decorated, and bows and sterns are graceful.

east monsoon. As a consequence of small and declining catches, the east coast consumer has been increasingly supplied in recent years with *kembong*, or mackerel, caught on the west coast.

51. Fresh water fishing is not as important as maritime fishing. In Thailand such activity is more or less restricted to the northern limits of the border area around

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Thale Luang. In Malaysia, on the other hand, fresh water fishing is somewhat more widespread and it contributes considerably to the diet of people living in the interior.

52. Maritime fishing methods vary considerably. Fixed traps along with different types of nets and lines are used inshore, while offshore, lines and drift nets are employed. As the fishing gear is generally hand operated, catches are never large. The industry is undergoing a transition, however, and in recent years motorized vessels have been widely introduced. Nevertheless, the range of fishing operations has not been extended as much as might be expected, probably because the fishermen, especially the Malays, are reluctant to remain at sea for more than a day at a time. Thai fishermen, perhaps in an effort to increase their catch, have been fishing recently in Malaysia's territorial waters. The Thai Government has warned them of the risks involved, but with little success, and Malaysia has now started seizing Thai fishing boats.

53. Fishing has always been an uncertain occupation, with fluctuations in catch from day to day, season to season, and year to year. Because of a marked downward trend in the availability of *kembong* in waters accessible to village fishermen, particularly in the east, and because of a decrease in the net income, fishermen are developing an interest in agriculture. In this respect their attention is directed more toward the production of rubber and oil palms than to the coconut palm. This is explained by the fact that most of the land suitable for commercial coconut production is already occupied, while vast tracts suitable for rubber and oil palm production are available in the sparsely populated interior.

Mining

54. Minerals in the border area may offer the best basis for economic diversification. Mining of tin and, to a lesser extent, iron ore already contributes importantly to the economy. Furthermore, it is possible that petroleum production may become significant in the future if offshore prospecting is successful.

55. Tin is currently the major mineral exported. Produced in Chinese- or European-owned mines located in the central portion of the Thailand sector of the border area and on the slopes of the westernmost mountain range in Malaysia, the ore is usually obtained by dredging or gravel pumping (see Figures 17 and 18). Smelters are located at Butterworth and Penang, Malaysia, and at Phuket in Thailand.

56. Tin producers, although plagued by price fluctuations, have in periods of declining prices been able to maintain their income at a more or less constant level by increasing production. However, as member countries of the International Tin Council have imposed export quotas on each other, increasing tin production in Malaysia is restricted. Some profits are realized through the sale of by-products that were formerly considered waste. The most important of these "wastes" are ilmenite (iron titanate), in demand in the paint industry, and monazite, used in metal alloys, color television tubes, and electronic systems.

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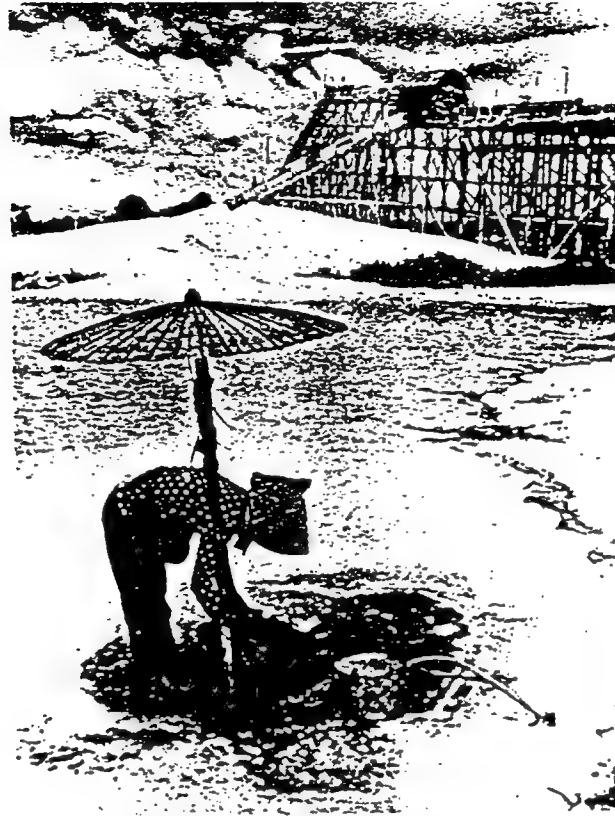


FIGURE 17. Tin mining in Malaysia. This woman is using a method of hand panning called "dulang" washing. In the background is some gravel-pumping equipment, usually operated by the Chinese.

One Malaysian producer, in fact, now mines monazite and produces tin as a byproduct.

57. Iron ore is mined in the Malaysian portion of the border area where the mines are not as profitable or as extensive as those located farther south. The bulk of the output of these mines is exported to Japan; most of it is taken to the east coast where it is loaded on large vessels anchored offshore, and the remainder is shipped from Butterworth.

58. Malaysia has granted an international mining firm prospecting rights to offshore tin deposits up to 12 miles at sea opposite the coasts of the states of Penang, Perak, and Selangor, and oil prospecting rights along the entire eastern Continental Shelf were granted to Esso Exploration Malaysia and Continental Oil of Malaysia. Thailand, also concerned about offshore deposits, has granted international petroleum companies prospecting concessions in the Gulf of Siam.

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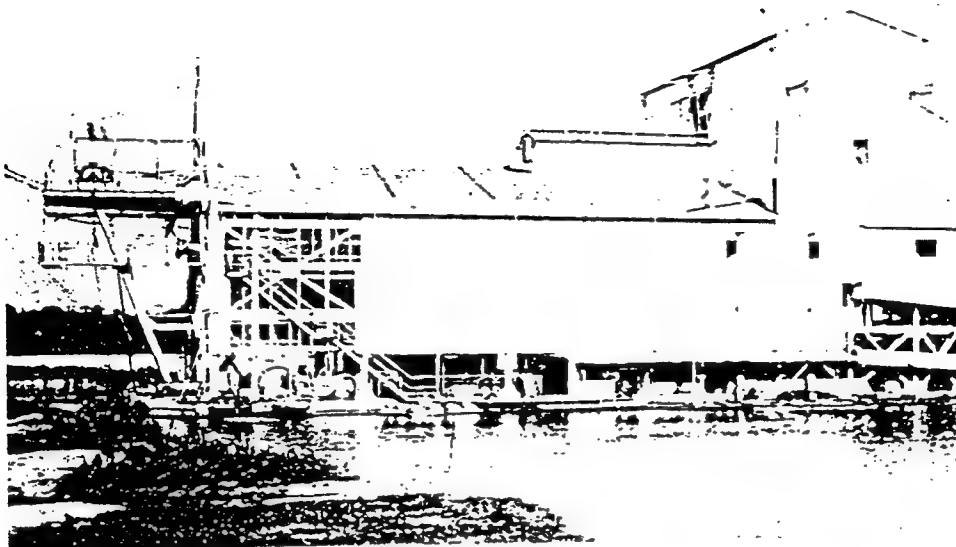


FIGURE 18. Tin dredge near Ipoh, Malaysia. Much of the tin on the peninsula is mined by large, mechanically operated bucket dredges, usually powered by electricity; most such dredges are foreign owned. Dredging is the only practical method of working tin sands in swampy or wet ground, and it allows working of low-grade deposits at the lowest possible cost.

TRANSPORTATION

(See Map 1)

59. The transportation grid in the border area connects the important sectors of the coasts of both countries—the east coast in Thailand with the west coast in Malaysia. Major transport arteries also pass through the mountainous interior following valleys that parallel the north-south grain of the land.

Waterways

60. Inland waterways are important to transportation, especially during the wet season when roads and trails may become impassable. Many streams are navigable only by native craft, however, because they are quite shallow and, on the east coast, choked with sandbars downstream. On the west coast, steep stream gradients confine boats to those parts of streams that are within the narrow coastal plain.

61. More significant is maritime coastal transport. Both Thai and Malaysian ports on the east coast funnel goods into Bangkok and Singapore, while west coast trade from Thailand and Malaysia goes to and from Penang, Port Swettenham, and Singapore. The Thais are currently considering the need for a deep-water port in Phuket.

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62. Controversy still surrounds the proposed Kra Isthmus Canal across Thailand—an idea which has been periodically advanced since World War II. Two schemes have been advanced: one proposes to build the canal across the narrowest part of the Kra Isthmus, about 10° north of the Equator, starting at the town of Ranong (the original plan) and the other advocates cutting across the peninsula northwest of the city of Songkhla. Much of the objection to building the canal comes from Singapore, whose prominence as the main port of Southeast Asia would be threatened. Thailand, too, has its anxieties over the canal, since it would tend to isolate the Thai Muslims from Bangkok and tie them more closely to Malaysia.

Railroads

63. The railroads and roads of the peninsula generally complement one another, providing a reasonably good overland transportation net. Railroads are meter gage (3 feet 3 $\frac{3}{8}$ inches) in both countries and cross the border in two places—along the eastern coastal plain between Pasir Mas, Malaysia, and Sungei Kolok, Thailand (see Figure 19) and on the west coast through a wide valley between Padang Besar, Malaysia, and Khlong Ngae, Thailand. The two lines join at Gemas, Malaysia, and continue southward as a single line to Singapore; similarly, north of the border they merge into a single line at Hat Yai, Thailand, and continue northward to Bangkok and points beyond.

Roads

64. In Malaysia the highway system is excellent, except along the underdeveloped east coast. The roads here are generally all weather and hard surfaced. In Thailand the road system is not as good, but efforts to convert main routes into all-weather roads continue (see Figure 20). Several roads and trails cross the border. In the west a road between Changlun, Malaysia, and Khlong Ngae, Thailand, passes through the same wide valley that accommodates the railroad; near the mountainous center of the peninsula a route traverses the border between Bailing, Malaysia, and Betong, Thailand; on the east coast several trails intersect the border, but there are no major highways. Elsewhere, footpaths and trails wind through the dense vegetation along the border.

Airways

65. Air transport, international and domestic, is available. Thai Airlines maintains regular connections between the border area and Bangkok, and it also provides an international connection between Songkhla, Thailand, and Penang, Malaysia. Currently, an airport to accommodate large jets is being constructed at Hat Yai; it will also be used for international traffic to Penang. Malaysia-Singapore Airlines provides international service as well as domestic connections between Kuala Lumpur and other major Malaysian airports and to the smaller towns in important tin and rubber production areas. Charter service to remote locations is also available.

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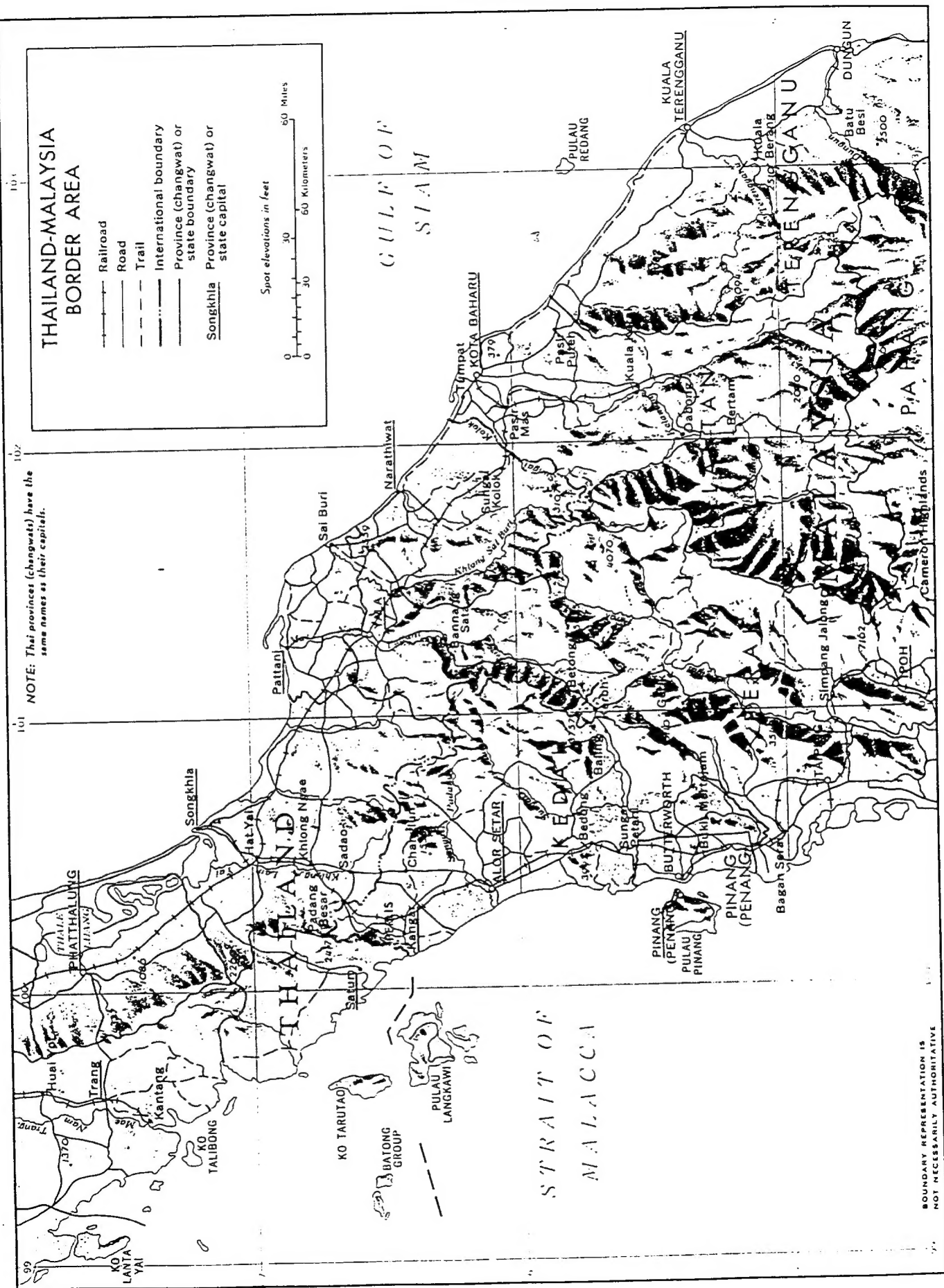


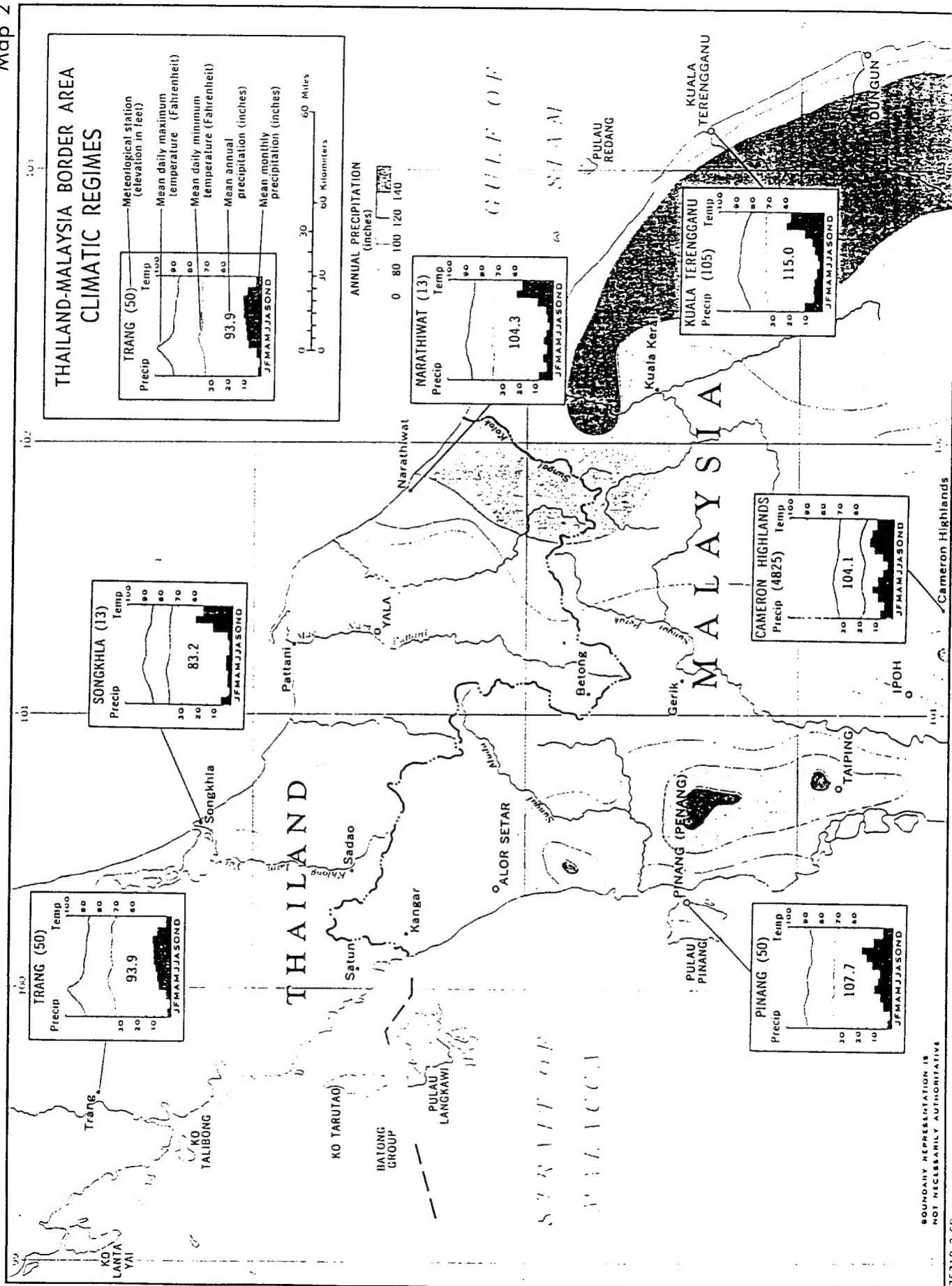
FIGURE 19. East coast rail line, 5 miles northwest of Sungai Kolok, Thailand. In the foothills a dispersed settlement pattern like that apparent in the photo is common. Rice is grown in the valley bottoms, and houses are located between the paddies and the tree cultivation on the lower slopes.



FIGURE 20. Route 11, 7 miles east of Khlong Ngae, Thailand. This main route was constructed as part of the national Six-Year Economic Development Plan (1961-66).

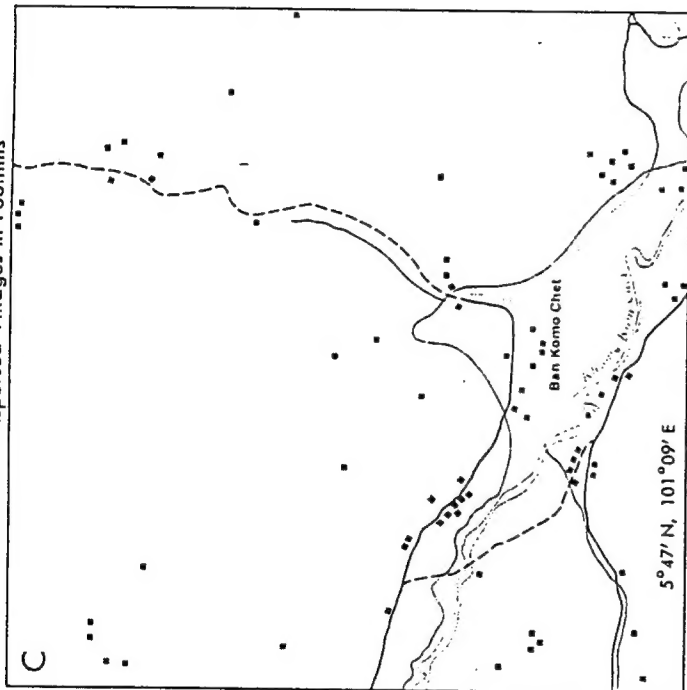
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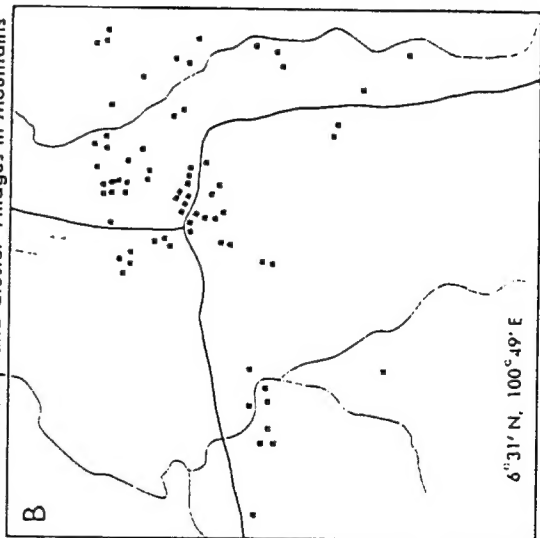


BOUNDARY REPRESENTATION IS NOT NECESSARILY AUTHORITATIVE

THAILAND-Dispersed Villages in Foothills



THAILAND-Strip and Cluster Villages in Mountains

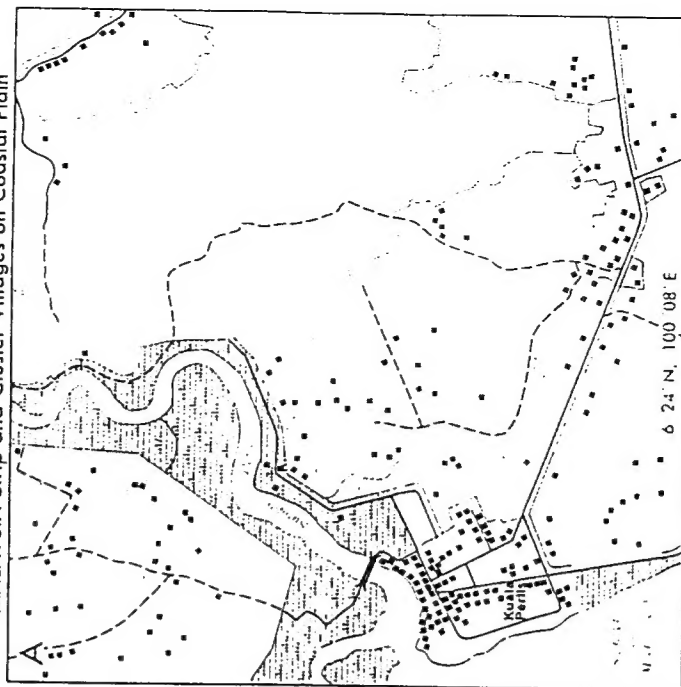


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THAILAND-MALAYSIA BORDER AREA SETTLEMENT PATTERNS

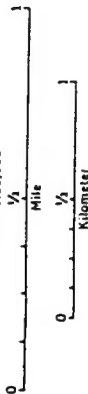
Terrain and land use influence the settlement pattern to a great extent. On map A the swampy west coast of Malaysia is almost devoid of settlement except for the higher ground on either side of the main road; and on map B in Thailand, near the Malaysia border, the mountainous terrain and dense vegetation confine settlement to strip and cluster villages in the valleys along the highway. In the river valley of Thailand, shown on map C, settlements are dispersed between two agricultural and topographic zones while the hills are unused.

Malaysia-Strip and Cluster Villages on Coastal Plain



- Building
- Road
- Trail
- Jungle
- Rubber
- Rice

Scale 1:25,000



SOURCES:

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